Name: _____

A2T Review Q3 Test 1.
This review is not comprehensive, be sure to study your notes, homework, and old tests as well.

1) Kathy deposits $25 into an investment account with an annual rate of 5%, compounded annually. The amount in her account can be determined by the formula $A = P(1 + R)^t$, where P is the amount deposited, R is the annual interest rate, and t is the number of years the money is invested. If she makes no other deposits or withdrawals, how much money will be in her account at the end of 15 years?

A) $25.75 B) $43.75 C) $51.97 D) $393.97

2) A population of wolves in a county is represented by the equation $P(t) = 80(0.98)^t$, where t is the number of years since 1998. Predict the number of wolves in the population in the year 2008. [*Show all work*.]

3) A house bought 10 years ago for $125,000 was just sold for $200,000. Find, to the nearest tenth of a percent, the annual growth rate. [*Show all work*.]

4) The growth of a colony of cells can be determined by the formula $G = I(3.1)^{0.226t}$, in which G represents the final number in the colony, I is the initial number of cells, and t represents elapsed time in hours. Find how many hours it will take for a colony starting at 25 cells to increase to a size of 25,000 cells. [*Round the answer to the nearest whole hour.*] [*Show all work*.]

5) At time $t = 0$, there are 100 bacteria in a colony. Given the formula $P(t) = 100(90)^{\frac{t}{9}}$, determine the time ($t$) (to the nearest thousandth) at which the colony will triple in population.

6) If $\log_b x = Y$, what is a value of x?

A) $\frac{Y}{b}$ B) $Y \cdot b$ C) Y^b D) b^Y

7) If $\log_5 x = 2$, what is a value of $\sqrt{x}$?

A) $\sqrt{5}$ B) 5 C) $2^{\frac{2}{5}}$ D) 25

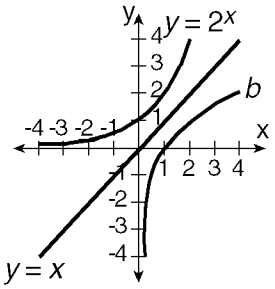
8) Which logarithmic equation is equivalent to $L^m = E$?

A) $\log_L E = m$ B) $\log_E m = L$ C) $\log_m E = L$ D) $\log_E L = m$

9) What is $\log_a x = b$ written in exponential form?

A) $b = a^x$ B) $a = b^x$ C) $b = x^a$ D) $x = a^b$

10) In the diagram below, figure b is the reflection of $y = 2^x$ in the line $y = x$.



Which is an expression for the equation of figure b?

A) $y = \log_2 x$ B) $y = \log_x 2$ C) $y = (-2)^x$ D) $y = 2^{-x}$

11) Which of the following is the inverse relation of $y = \log_4 x$?

A) $y^4 = x$ B) $4^y = x$ C) $4^x = y$ D) $x^4 = y$

12) The expression $\log_3 \sqrt{9x^3}$ is equivalent to

A) $3 + 3\log_3 x$ B) $1 + \frac{3}{2}\log_3 x$ C) $1 + 3\log_3 x$ D) $\frac{1}{2}(3 + x^3)$

13) José invested $10,000 at 8% interest that is compounded annually. If no other deposits or withdrawals are made, what is the value of this investment at the end of 7 years? [*Show all work*.]

14) The population of a Midwestern city t years from now is represented by the equation $P = 25{,}000e^{0.05t}$. In how many years from now, to the nearest tenth of a year, will the population be 50,000? [*Show all work*.]

15) The expression $\log a + \frac{1}{2}\log b$ is equivalent to

A) $(\log a)(\frac{1}{2}\log b)$ B) $\log (a + \sqrt{b})$ C) $\log a\sqrt{b}$ D) $\log \sqrt{ab}$

16) Solve for x: $\log_4 (x^2 + 3x) - \log_4 (x + 5) = 1$

17) Solve for x: $\log_4 (x - 3) = 1 - \log_4 x$

18) The solution set of the equation $x^2 - 2x - 15 = 0$ is

A) {3, 5} B) {3, -5} C) {-3, 5} D) {-3, -5}

19) For what value(s) of x is $\frac{4x - 5}{x^2 - 49}$ undefined?

A) +7 and -7 B) +7, only C) 0, only D) 0, +7, and -7

20) Simplify: $\dfrac{\frac{3}{x} - \frac{x}{3}}{\frac{1}{3} + \frac{1}{x}}$

21) What is $\frac{3}{2+3i}$ expressed with a rational denominator?

A) $\frac{-6-9i}{13}$ B) $\frac{6+9i}{13}$ C) $\frac{-6+9i}{13}$ D) $\frac{6-9i}{13}$

22) The value of $e^{3 \ln 4}$ is

A) e^{12} B) 64 C) 12 D) $\ln 12$

23) The expression $\ln (3e^{2x})$ is equivalent to

A) $3 + 2x$ B) $6x$ C) $\ln 3 + 2x$ D) $\ln 3 + x^2$

24) If p varies directly as q, and $p = 7$ when $q = 9$, find p when $q = 12$.

25) What is the solution set for the following system of equations?

$x^2 - y = 4$
$y = 3x$

A) (-4,12) and (-1,-3) B) (4,12) and (-1,-3) C) (-4,12), only D) (4,12), only

26) If $\log(x - 3) + \log(x + 4) - \log x = \log 5$, then the solution set for x is

A) {-2, 6} B) {6} C) {2, 6} D) {-6, 2}